

# Impacts of Sea-Level Rise on the California Coast



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# Talk Outline

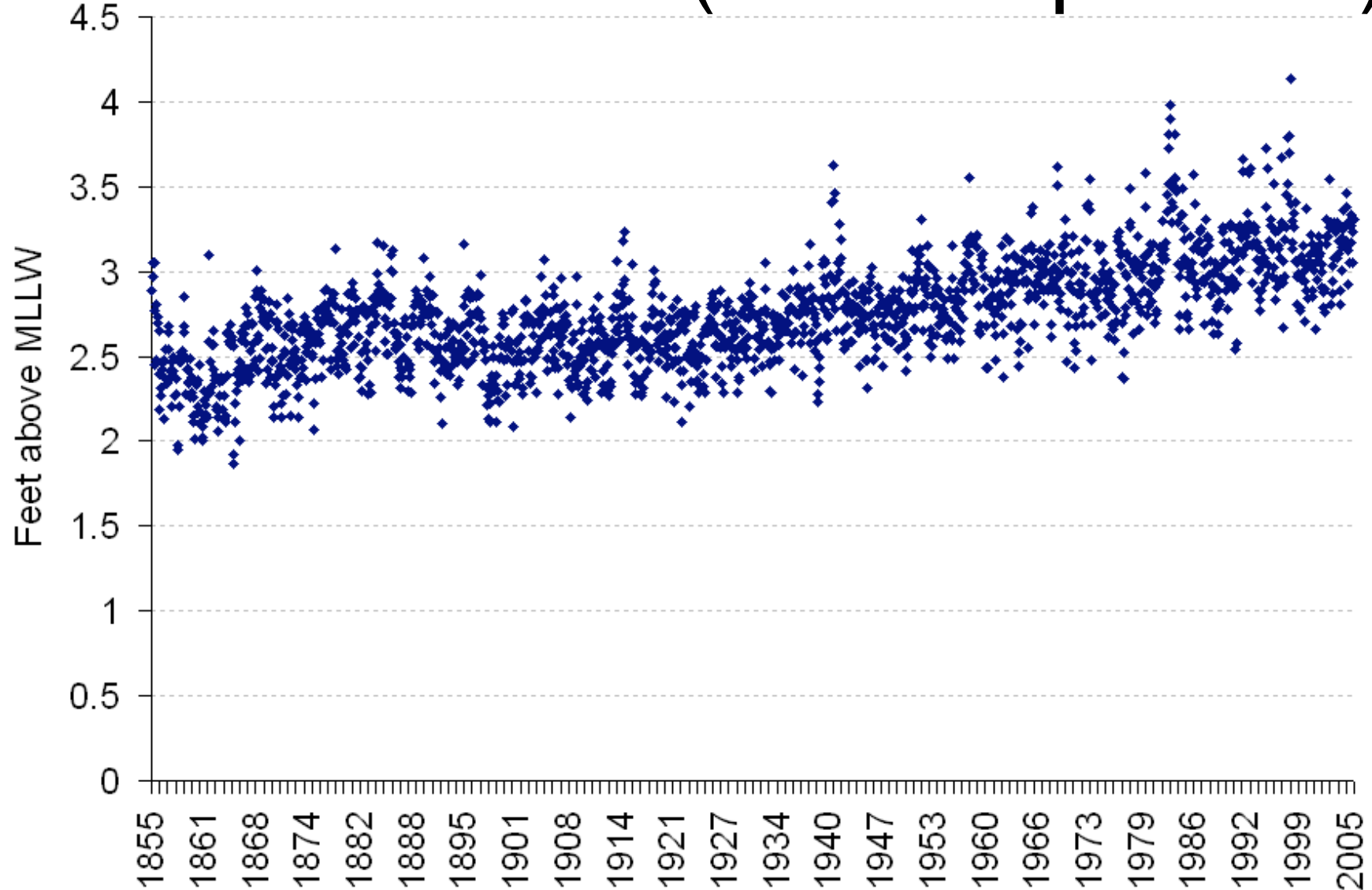
- Background
- Methodology
- Results
- Policy recommendations



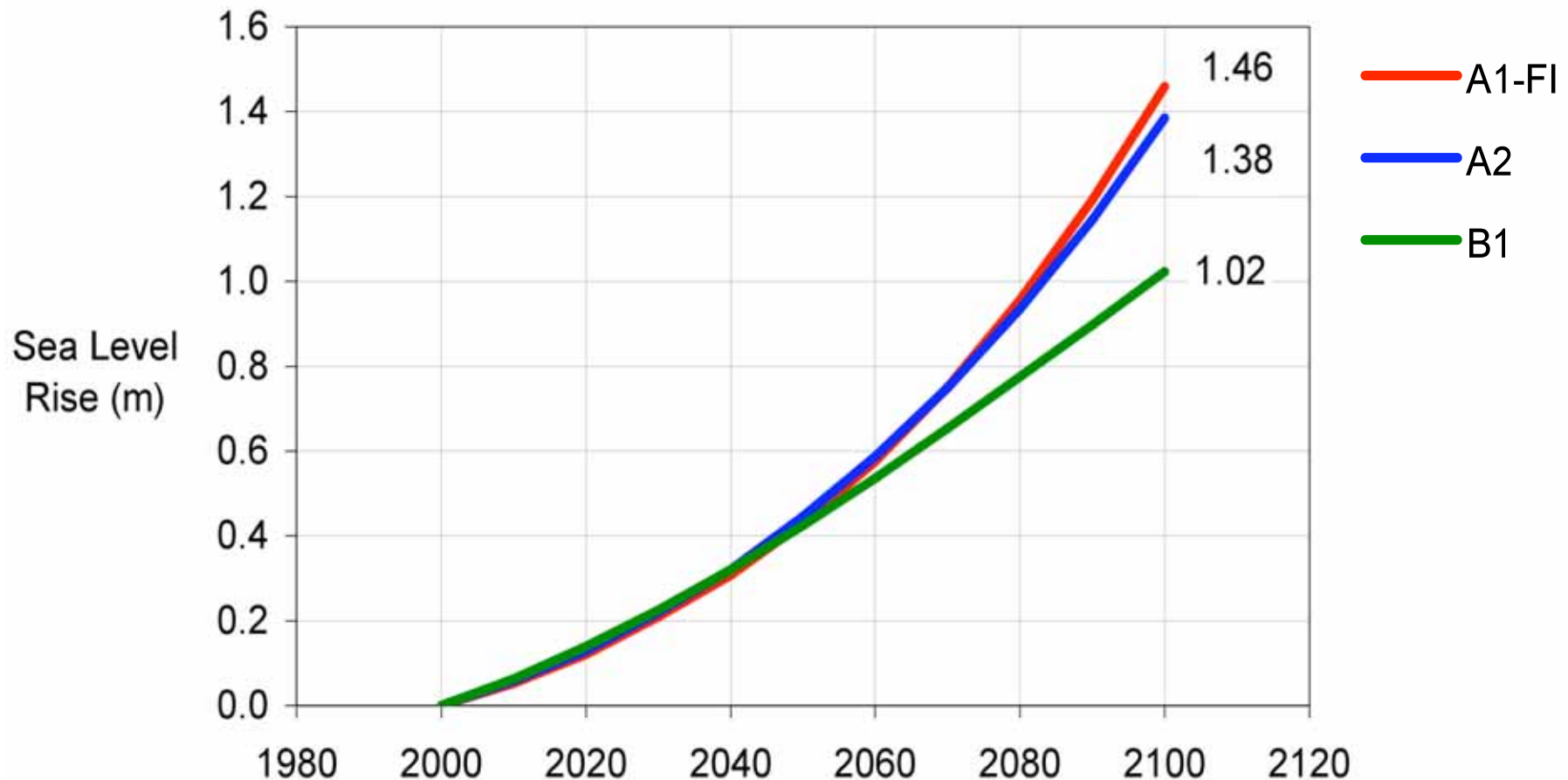
*Photo by D. Revell – 2/23/08*



# Sea level is already rising: San Francisco (1855 to present)

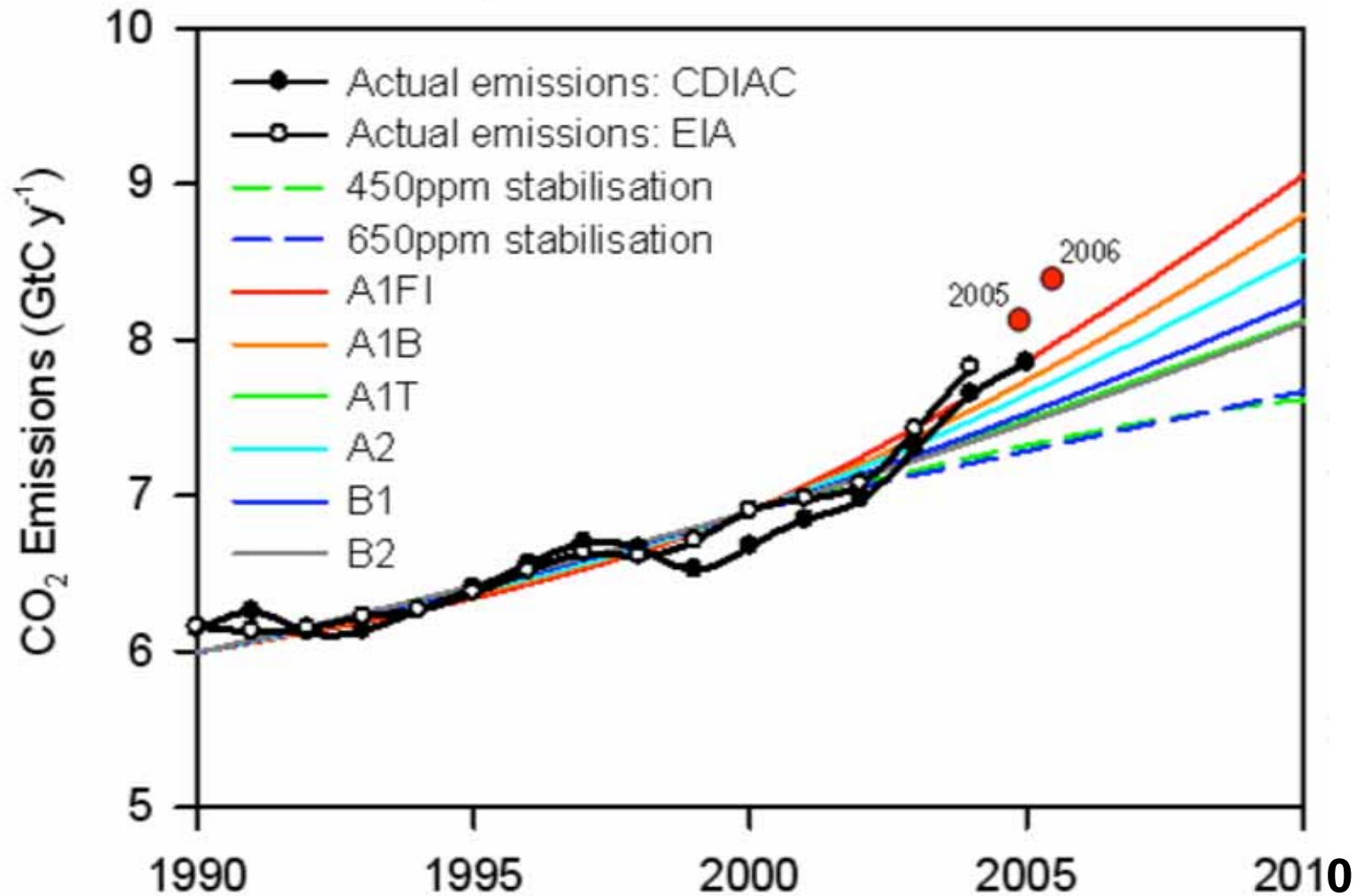


# Sea-level rise will accelerate: Scripps scenarios for California



Cayan et al. 2009. California Climate Change Scenarios and Sea Level Rise Estimates for California. 2008 Climate Change Scenarios Assessment. California Climate Change Center.

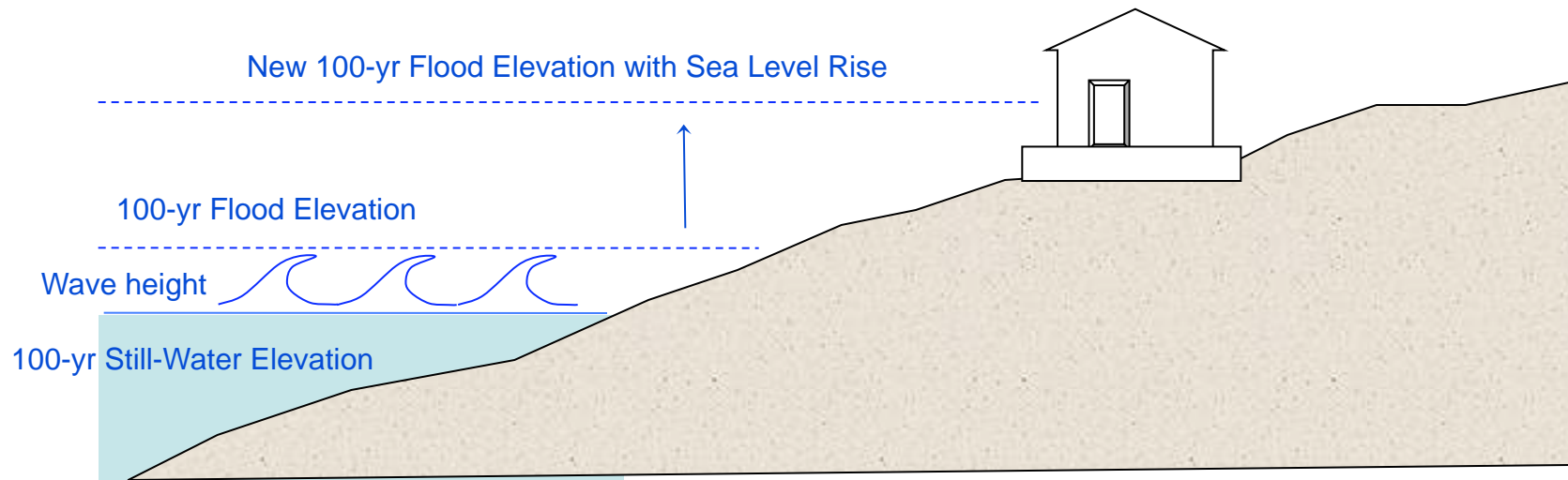
# Global emissions already exceed high IPCC scenarios



## Methodology

- Produce maps of the areas at risk from **flooding** and **erosion** with a **1.4 m** sea-level rise.
- Identify and quantify the people, infrastructure, ecosystems, and property in those areas.
- Evaluate cost of a protective response (coastal armoring).

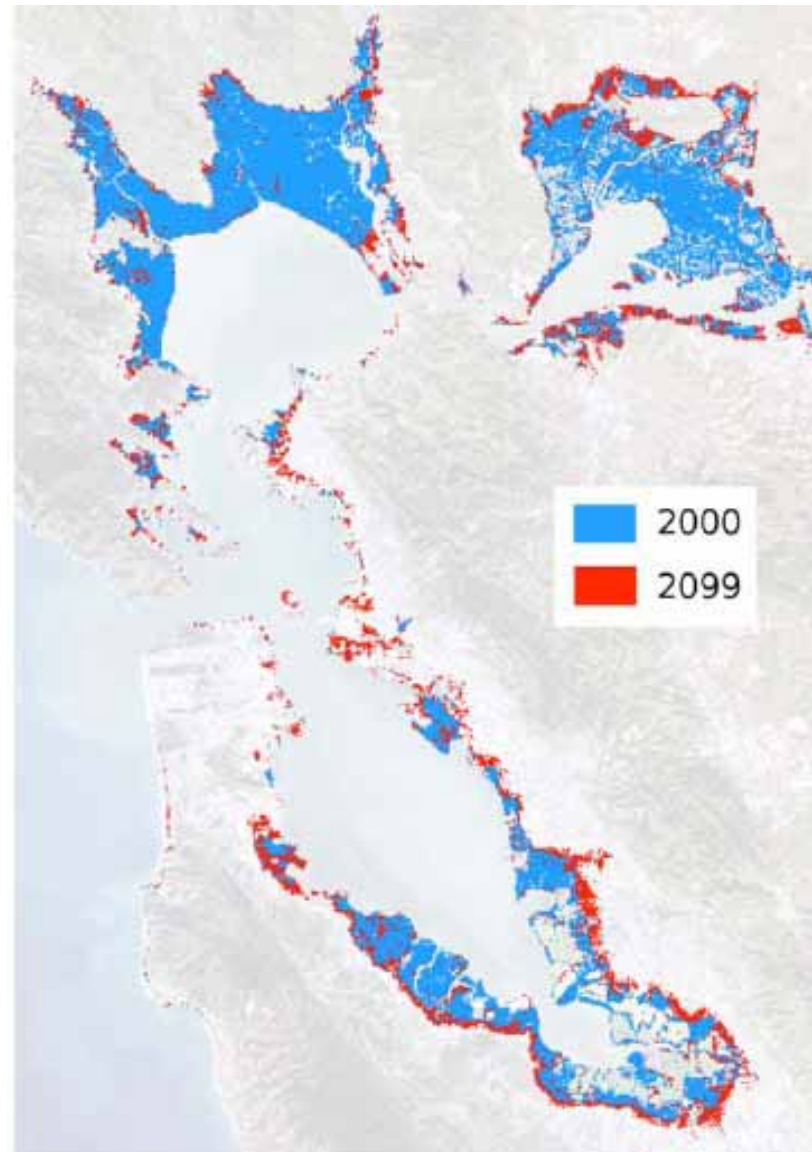
# Mapping Areas at Risk of Flooding



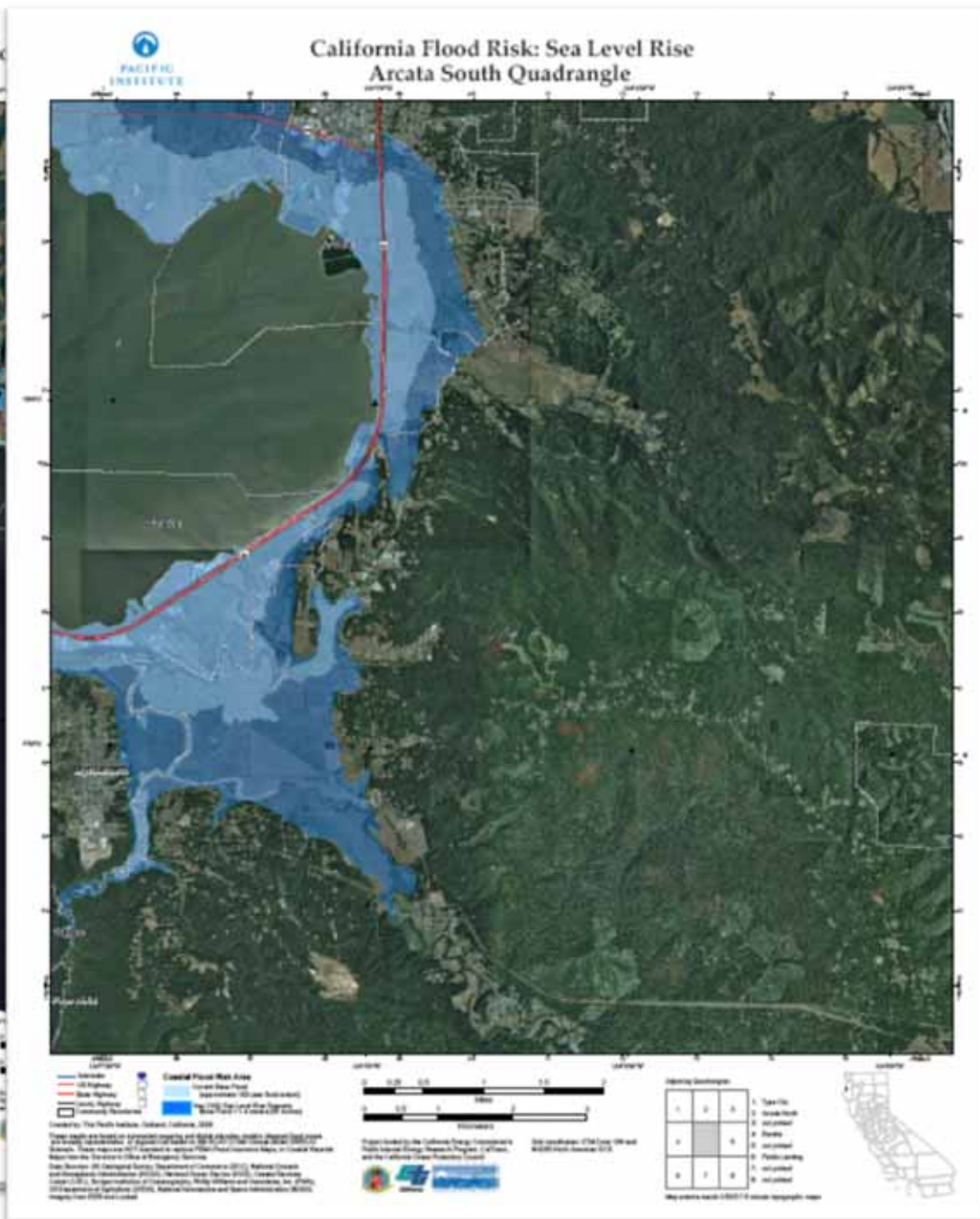
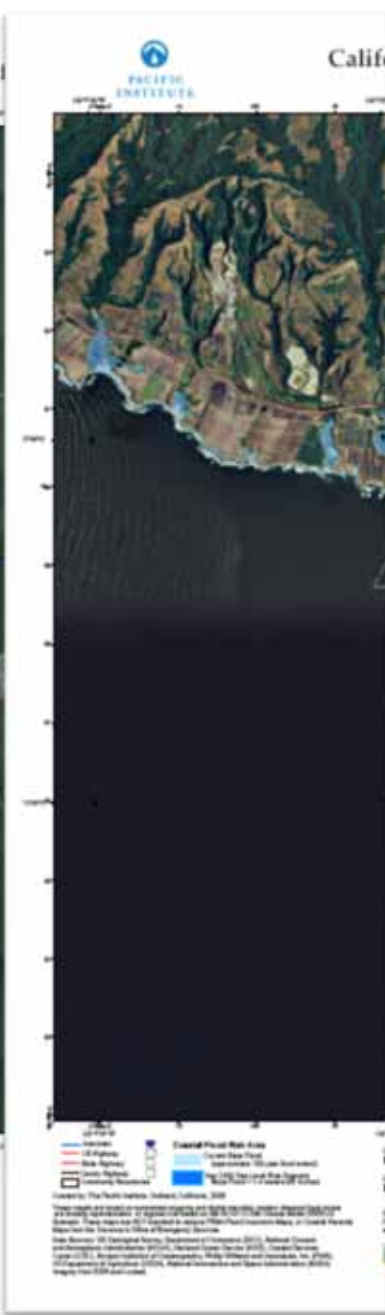
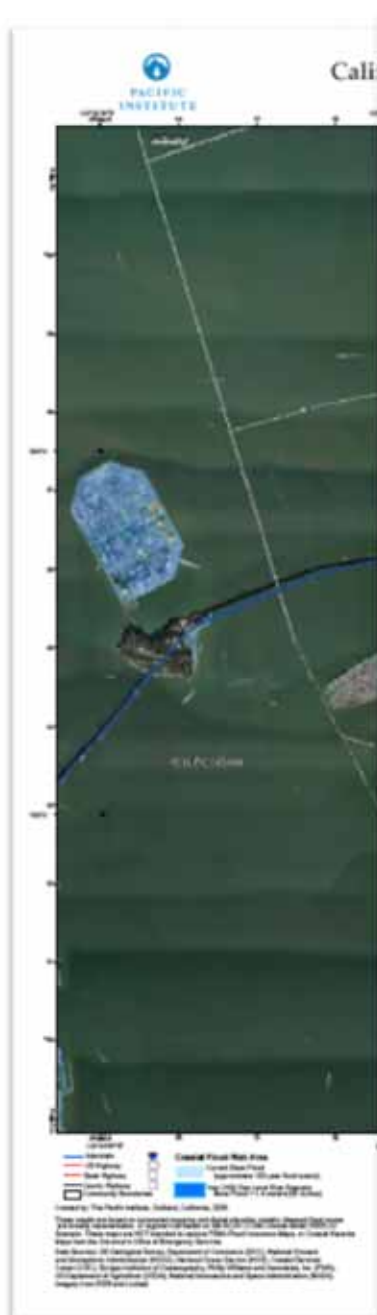
- Review all existing FEMA Flood Insurance Studies for the coast
- Develop coastal Base Flood Elevations (BFE) layer in GIS
- Add sea-level rise scenario (1.4 m) to BFE elevations
- Intersect with terrain datasets



# San Francisco Bay Region

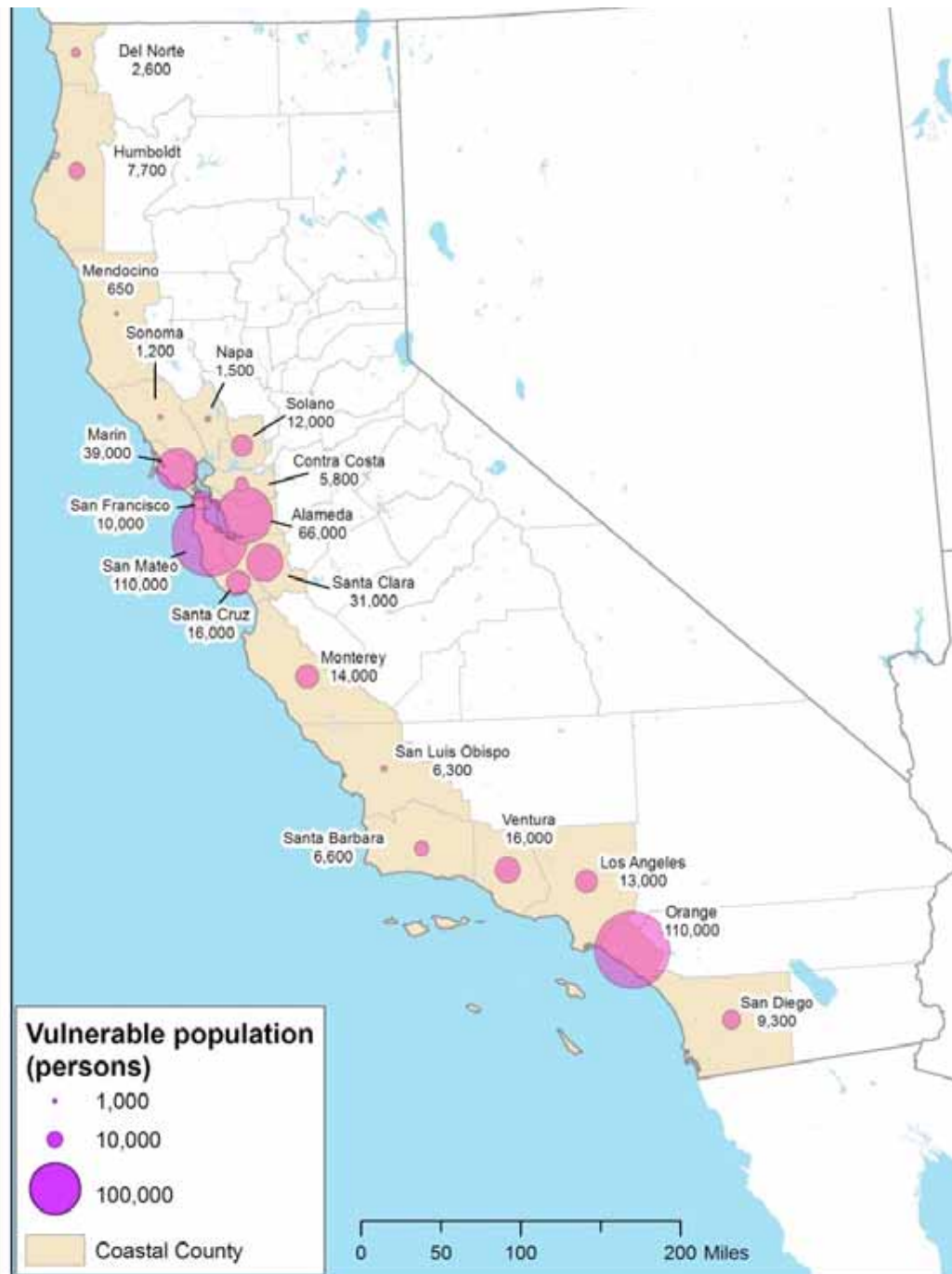






# Population at Risk

- 480,000 people
- 300,000 workers
- Large numbers of low-income people and communities of color



# Power Plants at Risk

- 30 coastal power plants
- 10,000 MW



# Other Infrastructure at Risk from Flooding

- Roadways: 3,500 miles
- Railroads: 280 miles
- Schools: 140
- Police/fire stations: 34
- Healthcare facilities: 55
- Wastewater treatment plants: 28
- Parks, airports, ports, bridge access, and more...





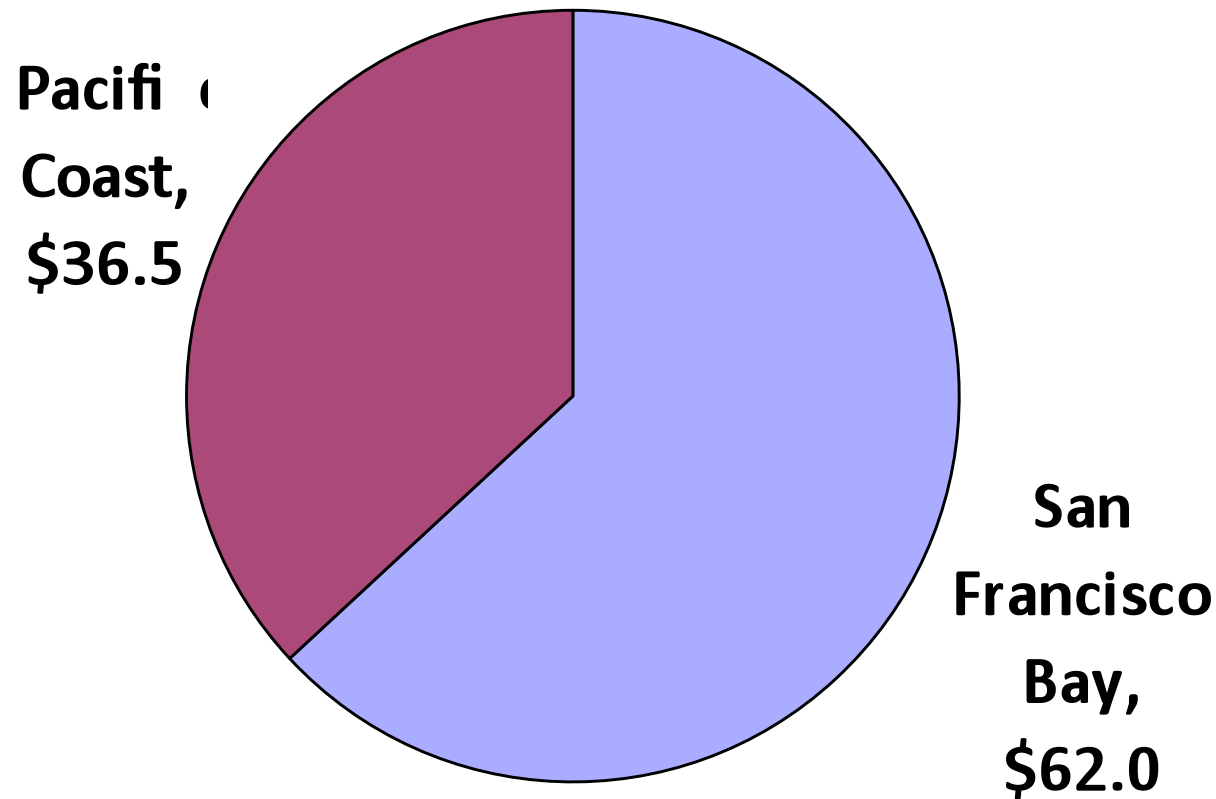
# Wetlands



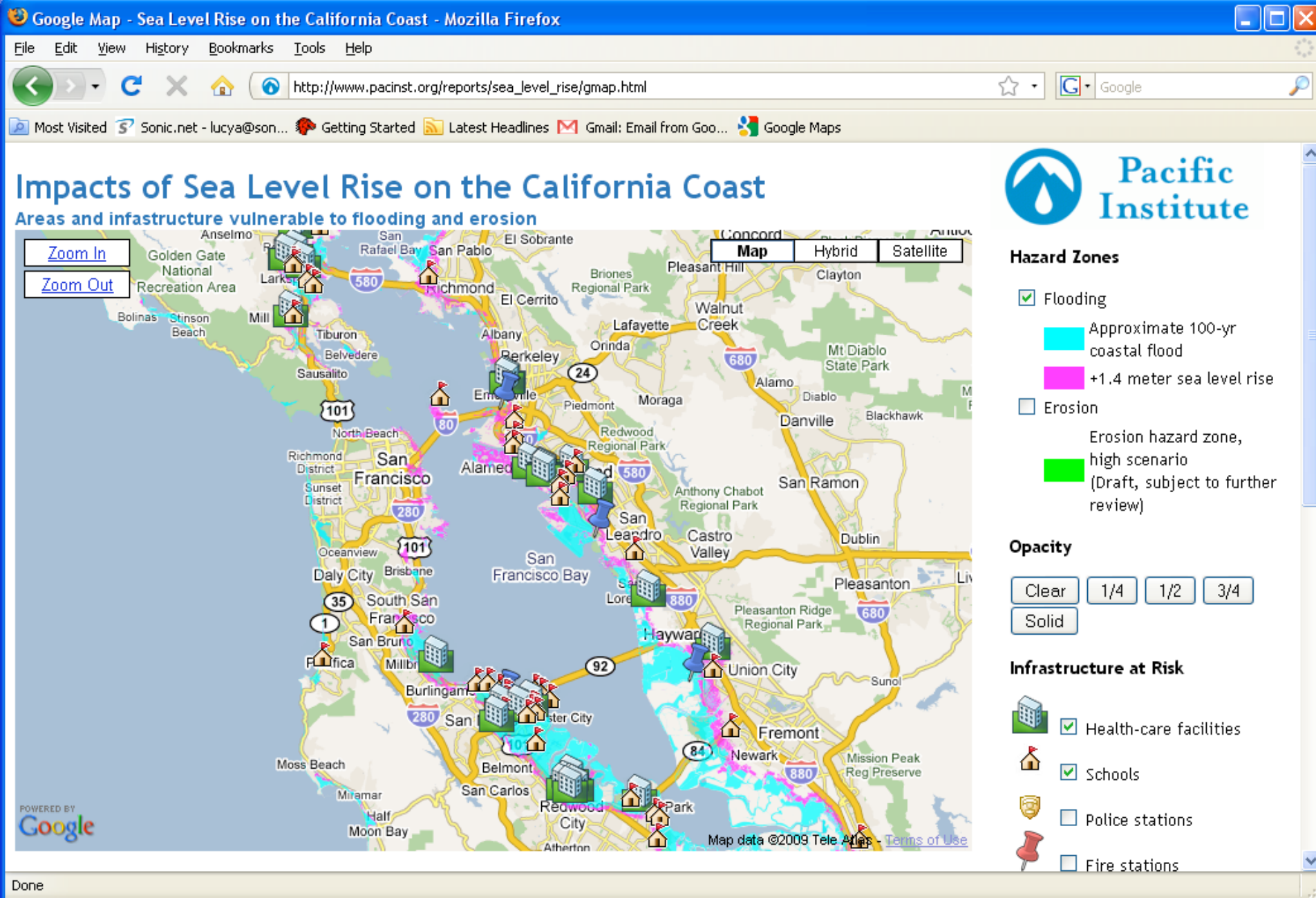
North Richmond, California

- 90% of CA wetlands already eliminated
- 150 mi<sup>2</sup> of potential wetland migration area
- 70% would make viable wetland habitat

# Property at Risk from Flooding



Value of building and contents; year 2000 dollars.





# Coastal Armoring?



Source: California Coastal Records Project

# Policy and Management Recommendations

- Integrate climate change and sea-level rise into the design of all coastal structures.
- Limit new development in high risk areas.
- Wetlands and the potential migratory paths should be protected.
- Communities most vulnerable to harm must be meaningfully involved in developing preparation and adaptation strategies.

# Conclusions

- Climate change will inevitably change the character of the California coast.
- We can expect increased flooding and erosion.
- Large populations and extensive infrastructure will be at risk.
- We must begin adaptation planning now.

# Thank you!

For the full report, to download PDFs of inundation maps and to access an interactive Google map of sea-level rise impacts, go to **[www.pacinst.org](http://www.pacinst.org)**